impregnated with crystals of native sulphur. As shown by Daubrée, there is no doubt but that a chemical action has taken place between the organic matter and the plaster to produce these crystals of sulphur. A similar reaction may explain the formation of sulphur in stratified rocks.

MINERALOGICAL NOTES.—The amethysts of the Saxon Obergebirge are found frequently to have become soft and friable. They are often reduced to a fine powder, in which state they are known as *mealy quartz.*——An asbestos from Silesia, made up of short bundles of white interwoven fibers, has been found to contain more than three per cent. of soda.——*Gilbertite*, a mineral from the Saxo-Bohemian tin veins is, according to Frenzel, not a distinct species, but a transition product of the alteration of topaz into potash-mica. The topaz becoming white or greenish-gray, is then called gilbertite, while the latter afterwards becoming laminated and paler in color, finally becomes a potash-mica. Such changes of mineral species are of great interest. ——E. F. Smith and N. W. Thomas announce new localities for *corundum* and *wavellite* in Lehigh county, Penna. The former occurs in well defined and often large hexagonal crystals near Shimersville. One crystal was eight inches long and four and a-half inches wide. The locality has been leased for technical purposes. Wavellite was found in white, radiating nodules upon limonite, near Macunzie, in the same county. It has the composition Al_2O_3 36.66, P_2O_5 34.14, H_2O 28.32, Fl. *trace*, limonite 0.60 = 99.72.—— At a recent meeting of the Microscopical Society of Belgium, M. Prinz read a paper upon the microscopic inclusions in sapphire, ruby and spinel. The paper is accompanied by a plate giving drawings of the remarkable liquid and solid enclosures, the crystals and the microlites which occur in these gems. The minute, hair-like crystals which produce the beautiful asterism of some rubies, are probably rutile.——*Cerite* has recently been shown to contain a new element, to which the provisional name of Beta-Didymium has been given. Ordinary didymium is supposed to be a mixture of at least three different elements, one being true didymium, another being a more basic element of lower atomic weight (Di-β) and the third a less basic element with higher atomic weight.

GEOGRAPHY AND TRAVELS.[1]

AFRICAN EXPLORATION.—Dr. Stecker has left Abyssinia for Kaffa in company with an embassy which has recently visited Abyssinia to offer the allegiance of the Sultan of Kaffa to King Johannes. He, therefore, has good reason to hope for a favorable reception in that country.

Some of the results of the six years' exploration of Shoa and

[1] Edited by ELLIS H. YARNALL, Philadelphia.

Southern Abyssinia by the Italians, are mentioned in a recent address by Captain Cecchi before the Italian Geographical Society. The position of twenty places has been determined by careful astronomical observations and the correctness of D'Abaddie's work in Enarea and Kaffa has been established. The furthest point reached by Cecchi and Chiarini are the River Maira in lat. 7° 40′ N., long. 39° 30′ E., undoubtedly one of the head streams of Haines River, and the kingdom of Kullo to the south of Kaffa which Cecchi traversed as far as lat. 6° 30′ N.

Another Italian, Captain Casati, has succeeded in visiting a few villages of Akka to the south of Tangasi, the present capital of Monhutter.

The *Academy*, in speaking of the report of Herr Marno of his survey of the Lower Bahr el Ghazal as far as the mouth of the Bahr el Arab in lat. 9° 5′ N., observes that as a matter of course it differs very essentially from all preceding surveys, so-called. In fact, no satisfactory map of a river of the nature of that in question can be produced, unless the surveyor is in a position to determine the location of a number of points by careful astronomical observations. At present, and notwithstanding the extensive labors of Petherick, Schweinfurth, Dr. Junker and others, not a single longitude has been satisfactorily determined in the vast region lying to the westward of the Upper Nile, while the latitudes are few and far between.

The latest news from the missionaries at Rubaga, Uganda, is very satisfactory. The weakening of the aggressive power of Egypt on the north has done much to restore quiet to the country.

A number of the natives engaged on the construction of the road from Lake Nyassa to Lake Tanganyika have been killed and the work was temporarily suspended, but it was hoped that operations would be resumed in May.

Dr. Pogge and Lieutenant Wissmann on the 11th of August, 1881, were in Mieketta, eight marches north-north-east from Kimbundo. They were proceeding northward and aiming to reach Mukenge's town in the country of the Tuschilange in about lat. 5° S. This is said to be about a thirty-six days' journey along the left bank of the Chikapa River to its junction with the Kassi, and thence down that stream to near the mouth of the Lulua. The Tuschilange are said to be great traders, and Dr. Pogge hopes to meet with no opposition in exploring their country and visiting Lake Mukambo, which is reputed to be about five days journey to the east. This body of water is described as about forty miles in circumference.

Dr. Buchner, in a paper read before the Bremen Geographical Society, describes the territory of the Muata Yanvo as consisting in the main of wide upland savannas, intersected by valleys, portions of which are densely wooded. The fauna is remarkably

poor. Neither lions nor elephants were seen by the explorer, and even antelopes were scarce, and never found in herds as in the south. The Muata Yanvo is avaricious, like all these African kings, but he is not cruel. Only three executions took place during Dr. Buchner's six months' residence, and these for criminal offences. At the residence of King Tambu, at Kabong, Dr. Buchner met with a very superior description of native weapons and woven fabrics, a fact which he thinks points to the existence of highly civilized tribes in the interior which have not hitherto come into contact with Europeans.—*Athenæum.*

The Royal Geographical Society's *Proceedings* states that the members of the Livingstone Inland Mission succeeded in reaching Stanley Pool in December last. They traveled on the south side of the Congo from Banza Manteka to a point opposite Bemba, and passed through forty miles of country not previously traversed by Europeans. They found it densely populated, villages or "towns" being passed every few miles.

The people were comparatively fearless and friendly, and food was fairly abundant, large gardens in a good state of cultivation surrounding most of the towns; the tracks of elephants and buffalos were continually seen during the journey, and sometimes the animals themselves at uncomfortably close quarters. At Bemba the party crossed to the north bank of the Congo and finished the journey to Stanley Pool on that side, reconnoitering the country with a view to the selection of suitable sites for future stations. They walked 169 miles in all, thirty-one of which were along Mr. Stanley's road, now nearly overgrown with grass. Bwa-Bwa-Njali and the other chiefs were at first friendly, but suddenly turned hostile and refused to let them cross to the south bank in order to carry out their plan of returning by that way. This action the missionaries seem to attribute to the operation of M. de Brazza's treaty, and they consequently retired to the Nkemke River, near which they secured land for a station from the chief of a populous district. Before proceeding with building operations, they went on to Bemba, and letters they there found waiting for them determined them first of all to explore the whole of the south bank from Bemba to Stanley Pool, in order to see which would be the best way to take up the steamer for the upper river. On this second journey of exploration the party started about the middle of January. On April 26th, reinforcements left Liverpool for the Congo, including a physician and a practical astronomer.

Dr. Danckelmann, a competent meteorologist, is about to join Mr. Stanley on the Congo.

Petermann's Mittheilungen publishes a recomputation of Stanley's hypsometrical observations, by Dr. Zöppritz, who assigns the Victoria Nyanza an altitude of 4058 feet.

Herr Flegel has started from Loko on the Benue for Adamawa.

Captain Burton and Commander Cameron have returned from the Gold Coast to England with large and valuable collections in all branches of natural history. Com. Cameron has also made extensive surveys.

Dr. Gumbel, director of the Bavarian Geological Survey, after an examination of specimens of ore from the Gold Coast, doubts whether there exists any country in the world which holds out so fair a hope of a continuous supply of gold as do the inland districts of the Gold Coast.

A correspondent of the London *Daily News* writes that the Italian travelers, Captain Bianchi and Signor Licata, are about to undertake an extensive journey in Africa. From the Bay of Biafra, in Guinea, they will traverse the hitherto unexplored high levels of the Cameroon Mountains in the direction of the Labi Lakes, and study the country in which rise the Congo, Niger, Gazelle Rivers, and Lake Tsad, to find the key of the hydrographic system of tropical Africa. From the lakes they will descend to Lake Luta, which was partly explored by Signor Gessi. They will then traverse the Uganda territory, going north-east towards the Gallas country, already known to Capt. Bianchi, and return to Italy *via* Abyssinia and the Red Sea, having thus crossed Africa from west to east. They believe it will take four years to complete this immense journey, which will have principally a scientific aim.

The Circumpolar Stations. — The steamer *Pola*, Captain Müller, left Pola on April 2d last with the staff and equipment of the Austrian Meteorological Expedition, consisting of fourteen persons. She expected to arrive at Jan Mayen early in May, and after leaving the party, with all the stores, will return home. The Austrians are to remain until August, 1883. Stores are supplied for two years, and three boats are provided for the escape of the expedition should the relief vessel not reach Jan Mayen next summer.

The German Committee held a meeting at Berlin on April 13th, and they are reported to have decided to erect one observing station in the northern arctic zone at Cumberland Sound, Davis Strait, and a second on one of the islands of South Georgia, 54° 30′ S. lat., 41° 30′ 15″ W. long., and some 1100 miles east of Cape Horn. The former expedition will be commanded by Dr. Giese and the latter by Dr. Schrader, of the Hamburg Observatory, and each will consist, besides, of six additional observers and three or four workmen. Both parties will leave Europe early in June. Dr. Schrader proceeding by mail steamer to Monte Video, and thence by a German man-of-war to their destination, but no definite arrangements have yet been made for the conveyance of Dr. Giese's expedition to Cumberland Sound.

The Swedes expect to open a station on Spitzbergen during the summer. It will probably be established at Mussel Bay, on

the east side of Wyde Bay on the northern coast of West Spitzbergen, where Nordenskiöld and Palander wintered in 1872–3, and the expedition expects to use the building then erected on Polhem Island. There will be thirteen in the party.

The British have finally selected Fort Rae for their station.

MICROSCOPY.[1]

MICROSCOPIC DEXTERITY OF THE CAMEO CUTTERS.—One of the best examples of adroit manipulation under the simple microscope is the operation of cameo cutting as described in an article in *Our Home and Science Gossip*:

"A visit to a cameo cutter's workshop found him seated at a table covered with tools, varying from a triangular-pointed steel instrument to the most delicate pointed bits of steel wire fastened in handles. Very fine files and knitting needles, set in wooden grips and ground to infinitesimal points, figured in the lot. On a pad of leather, before the cameo cutter, was a block of wood just big enough to be grasped with his hand, and cemented to the middle of it was an oval object that looked like a piece of alabaster, just big enough to make a seal for the finger of a man who did not object to wearing large rings. Upon this the artist was just finishing a copy, with a pencil pointed to needle fineness, of a photograph in profile of a gentleman, which was leaned against a little photograph easel before him. Having finished the outline, he laid his pencil by, and taking up a fine wire tool he scratched the pencil mark around with it. Then he took a darning needle with a sharp point and scratched the line deeper. He worked with a magnifying glass at his eye, and stopped continually to inspect the progress of his work with critical minuteness. Then he went at it again, working slowly, scratching over the same line again and again, and always examining after each scratch. He changed his tools as he went on, and from the darning needle descended to a trifling little fragment of steel wire, not as thick as an ordinary sewing needle, set in a slender handle. With this he scratched and re-scratched, until the lines he had drawn with his pencil had quite vanished, and a thin, fine streak of a dark color had marked the outline of the head he had been tracing his way around. Next he took one of his burin-like tools and commenced again. This time he worked on the outside of the outline, cutting and scraping at the surface until the white turned gray, then brown, and finally vanished, leaving the face in relief, surrounded by a black ground—that is, the portrait remained intact in the white substance which formed the outer layer of the cameo, while it had been cut away around it to the lower or dark layer. The portrait or figure is then modulated upon its surface until it assumes the roundness of nature. The edges are left square to the dark ground. This is necessary, as, if they are

[1] This department is edited by Dr. R. H. WARD, Troy, N. Y.